deceleration at the center of gravity of the head form expressed as a multiple of g (units of gravity).

(iii) Compliance with the HIC limit must be demonstrated by measuring the head impact during dynamic testing as prescribed in paragraphs (b)(1) and (b)(2) of this section or by a separate showing of compliance with the head injury criteria using test or analysis procedures.

(6) Loads in individual shoulder harness straps may not exceed 1,750 pounds. If dual straps are used for retaining the upper torso, the total strap loads may not exceed 2,000 pounds.

(7) The compression load measured between the pelvis and the lumbar spine of the ATD may not exceed 1,500 pounds.

(d) For all single-engine airplanes with a V_{SO} of more than 61 knots at maximum weight, and those multiengine airplanes of 6,000 pounds or less maximum weight with a V_{SO} of more than 61 knots at maximum weight that do not comply with §23.67(a)(1);

(1) The ultimate load factors of §23.561(b) must be increased by multiplying the load factors by the square of the ratio of the increased stall speed to 61 knots. The increased ultimate load factors need not exceed the values reached at a V_{S0} of 79 knots. The upward ultimate load factor for acrobatic category airplanes need not exceed 5.0g.

(2) The seat/restraint system test required by paragraph (b)(1) of this section must be conducted in accordance with the following criteria:

(i) The change in velocity may not be less than 31 feet per second.

(ii)(A) The peak deceleration (g_p) of 19g and 15g must be increased and multiplied by the square of the ratio of the increased stall speed to 61 knots:

g_p=19.0 $(V_{S0}/61)^2$ or g_p=15.0 $(V_{S0}/61)^2$

(B) The peak deceleration need not exceed the value reached at a V_{S0} of 79 knots.

(iii) The peak deceleration must occur in not more than time (t_r), which must be computed as follows:

$$t_r = \frac{31}{32.2\left(g_p\right)} = \frac{.96}{g_p}$$

where—

g_p=The peak deceleration calculated in accordance with paragraph (d)(2)(ii) of this section

t_r=The rise time (in seconds) to the peak deceleration.

(e) An alternate approach that achieves an equivalent, or greater, level of occupant protection to that required by this section may be used if substantiated on a rational basis.

[Amdt. 23–36, 53 FR 30812, Aug. 15, 1988, as amended by Amdt. 23–44, 58 FR 38639, July 19, 1993; Amdt. 23–50, 61 FR 5192, Feb. 9, 1996]

FATIGUE EVALUATION

§23.571 Metallic pressurized cabin structures.

For normal, utility, and acrobatic category airplanes, the strength, detail design, and fabrication of the metallic structure of the pressure cabin must be evaluated under one of the following:

(a) A fatigue strength investigation in which the structure is shown by tests, or by analysis supported by test evidence, to be able to withstand the repeated loads of variable magnitude expected in service; or

(b) A fail safe strength investigation, in which it is shown by analysis, tests, or both that catastrophic failure of the structure is not probable after fatigue failure, or obvious partial failure, of a principal structural element, and that the remaining structures are able to withstand a static ultimate load factor of 75 percent of the limit load factor at V_C, considering the combined effects of normal operating pressures, expected external aerodynamic pressures, and flight loads. These loads must be multiplied by a factor of 1.15 unless the dynamic effects of failure under static load are otherwise considered.

(c) The damage tolerance evaluation of §23.573(b).

[Doc. No. 4080, 29 FR 17955, Dec. 18, 1964, as amended by Amdt. 23–14, 38 FR 31821, Nov. 19, 1973; Amdt. 23–45, 58 FR 42163, Aug. 6, 1993; Amdt. 23–48, 61 FR 5147, Feb. 9, 1996]

§23.572 Metallic wing, empennage, and associated structures.

(a) For normal, utility, and acrobatic category airplanes, the strength, detail design, and fabrication of those parts of the airframe structure whose failure